

## Motion

- If you want to understand how an object (like a car, ball, person, or rocket) moves, you have to understand three things about what it means "to be moving."
- These three things are:
  - Position. This is precisely where an object is located.
  - Speed. Precisely how fast an object is moving.
  - Acceleration. Precisely how fast an object's speed is changing.

## **Significant Digits**

- When we measure and calculate values, we can only use a number of digits in our answer that has been accurately measured.
- “certain plus one”

## Rules for counting Sig Figs:

→ KNOW THIS!

→ All digits included in a stated value from 1-9 are significant example: 132.23 has 5 sig figs

→ leading zeros, are not significant, example: 0.0034 has only 2 sig figs

→ Lagging zeros count when they are after a decimal, example: 3000 has 1 sig fig, 2.000 has 4.

• How many sig figs?

.57

	<u>1.25</u> cm	3
	<u>123.7</u> mph	4
*	<u>30.09</u> m/s	4
	<u>0.57</u> km	2
*	<u>0.045</u> m	2
	<u>leading</u>	

~~0~~ ~~0~~ 3 0 0 9 ~~0~~ ~~0~~

### Rounding Numbers

- If the digit after the digit to be rounded is 5 or larger, round up. If not leave the number as is.

6/9

0.66666

--↑

0.67  $\times 100 = 67$

0.6448

0.64

Example:

- 9.147 cm rounded to three Sig. Digits is 9.15 cm.
- 7.23 g rounded to two Sig. Digits is 7.2 g.

Rounding Ex:

Try:

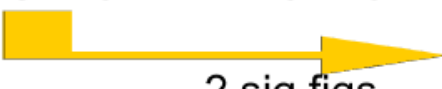
- 0.0327 rounded to two s.d. 0.033
- 15.430 rounded to three s.d. 15.4

## The Certainty Rule for Multiplying & Dividing

- If you're multiplying two 4 digit numbers your answer will produce a seven or eight digit answer. How do we know how many significant digits to include?
- Follow this rule:

• When multiplying and/or dividing, the answer has the same number of significant digits as the measurement with the fewest number of significant digits.

$$3.2 \text{ cm} \times 10.1 \text{ cm} = 32.32 \text{ cm}$$

  $= 32 \text{ cm}^2$

least  
number  
of sig figs when multiplying  
(or dividing)

### The Precision Rule for Adding and Subtracting

- The answer of an addition or a subtraction should be rounded off to the least precise value involved. (the measurement with the fewest decimal places).

*add/subtract* e.g.  $107.0 \text{ cm}$   
*least number*  $+ 32.18 \text{ cm}$   
*of places*  $139.18 \text{ cm}$  (math answer)  
*past the decimal*  $139.2 \text{ cm}$

(answer has only one decimal place because 107.0 cm has only 1 decimal place and is the least precise)

Measure the length and width of your counter with a meter stick.

Record the length and width to the proper number of significant digits.

Calculate the area using the formula

$$A = \text{length} \times \text{width}$$

Record the answer in square cm using the proper number of significant digits.

Details: Put both of your names on your piece of looseleaf. Record

$$l = \underline{\hspace{2cm}} \text{ cm}$$

$$w = \underline{\hspace{2cm}} \text{ cm}$$

$$A = l \times w \text{ and show all work}$$